

The Examiner rejected claim 12 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In accordance with the Examiners recommendation Claim 12 has now been amended and it is believed that claim 12 is now allowable.

The Examiner rejected Claims 11-13 on the grounds of obviousness-type double patenting over Claims 1 and 10 of prior U.S. patent No. 6,020,586. Applicant submits herewith a Terminal Disclaimer disclaiming the portion of the term of the patent to issue from the instant application that would extend beyond the term of the '586 patent. If there are any deficiencies in the Terminal Disclaimer, or if the Office requires any additional information or documentation in order to allow the application, the Examiner is requested to telephone the undersigned.

The examiner further rejected Claims 11-13 under 35 U.S.C. 102(b) as being anticipated by Davis et. al (US Pat. No. 5,180,914). The Examiner stated that the Davis system includes an ion storage quadrupole. It is believed the Examiner is in error in stating that there is a quadrupole shown or disclosed in the Davis system. Davis does not deal with multipole ion guide, and the reference to column 5, lines 7-8 is to a quadrupole field. That is an electrostatic quadrupole field in which there are DC voltages applied. In a multipole ion guide, as in the present invention, there is RF-AC applied to the multipole ion guide, and the structure of an electrostatic quadrupole field is entirely different from a multipole ion guide. They operate differently, their control of ion movement is entirely different and there is no relationship between them that is relevant to the rejection in this case.

It is believed the Examiner has misunderstood the statement of quadrupole field in Davis to be that of a multipole ion guide, which it is not. Indeed, Davis fails to show any multipole ion guide in his patent.

The Examiner states that there are ions in quadrupole 20, but numeral 20 is a Time-Of-Flight tube, which is not a multipole ion guide. An electrostatic quadrupole field as in Davis relates to the distribution of the electrostatic potential, and column 4, at line 13, discloses the electrostatic potential relationship is an electrostatic quadrupole field. The term quadrupole as used in "electrostatic quadrupole field" is derived from the fact that the electrostatic field follows the laws of quadratic equations.

Additionally, the ion flow of Davis is not continuous, but the ions are intended to be trapped substantially concurrently as opposed to flow continuously through the multipole ion guide of the present invention. In particular, the duty cycle sought to be achieved in Davis is 10.7% (which is wildly optimistic), whereas with the present invention of a multipole ion guide under RF control, a 100% duty cycle is achievable.

Thus, the Davis patent is unrelated to the subject matter of the present invention - it is related to DC applied to electrodes operating under quadratic equations which results in a quadrupole field. This is not the same as a multipole ion guide where there are multiple poles are generally parallel to each other with ions passing therethrough controlled by AC-RF signals.

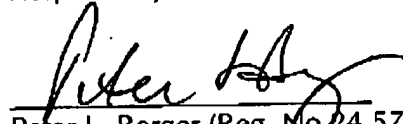
Still further, the '468 present application uses a two-dimensional ion trap and clearly distinguishes itself over the prior art by providing the capability of a 100% duty

cycle. As discussed in the '468 application (page 3, lines 17-20), "the three dimensional ion trap can not be filled and emptied at the same time" (which is in Davis).

In contrast, insofar as Davis is at all relevant, it actually teaches away from the '468 application. Davis, in his reference to the ion trap (Column 5, lines 16-24) clearly states: "A region of the electrostatic quadrupole field can be generated using an electrode structure having rotational symmetry about the longitudinal x-axis, and an electrode structure such as this is preferred because it has a focusing effect on the ions in the Y-Z plane. Such rotationally symmetric electrode structures will be referred to hereinafter as "three-dimensional electrode structures." In fact, the three dimensional ion trap of Davis would actually limit the intensity of an ion beam, failing to take full advantage of the rapid spectra analysis provided by a TOF mass analyzer.

Prompt and favorable reconsideration on all claims is earnestly solicited.

Respectfully submitted,



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CLAIM AS AMENDED MARKED UP TO SHOW CHANGES:

12. (Amended) An apparatus as set forth in Claim 11 comprising means to control the [time relationship between the time to raise timing] timing of said means for pulsing said ions transferred into said pulsing region [to be able to perform said pulsing and said multipole ion guide pulse time controls the duty cycle of said analyzer].